Evaluation of California's Special Drive Test Program

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13. ABSTRACT *(Maximum 200 words)*

This report presents results of an evaluation of the department's special drive test (SDT) program. A total of 407 forms used to refer drivers for an SDT and to score their performance on the test were collected over a 2-week period in October 1993 from 82 field locations. The driver records for these subjects were also analyzed. The results showed that the SDT had a fail rate of 31.1% and an internal-consistency reliability of .88. The vast majority (3/4) of SDT referrals were not recommended for a license restriction (e.g., no night driving), although 96% of SDT fails were under license suspension or revocation sometime during the 6 months following SDT testing. The driver record analysis revealed that the 3-year prior total accident rate for SDT subjects was 3 times higher than that for drivers of the same age and sex in the general driving population. For 3-year prior total citations, the rate for SDT subjects was nearly twice as high as the standardized rate for other drivers. The 3-year prior accident rate for SDT fails was not significantly different from that for SDT passes, but SDT fails had a significantly lower 3-year prior total citation rate than did SDT passes.

It was concluded that (1) available treatments (e.g., license restrictions) for incompetent drivers referred for an SDT are underutilized, (2) the SDT is not effective in discriminating between low- and high-risk drivers, and (3) the SDT program appears to reduce accident risk for drivers who fail the test but not for those who pass. It was recommended that a unified policy directive be developed that would address the objective of the SDT and specify the criteria to be used for referring applicants for an SDT, scoring the test, and translating test performance into a licensing decision.

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PREFACE

This report presents findings of the first phase of an evaluation of California's special drive test program. The report is being issued as an internal monograph of the Department of Motor Vehicles' Research and Development Section rather than as an official report of the State of California. The findings and opinions may therefore not represent the views and policies of the State of California.

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EXECUTIVE SUMMARY

Background
California driver licensing policy permits drivers who cannot pass a regular drive test or who have a driving-related physical or mental condition to be referred for a special drive test (SDT). This test is failed only if the driver makes a serious maneuver error that results in a collision or that poses a direct hazard to other drivers or pedestrians. This scoring characteristic differs from that of the department's regular drive test in which subjects can be failed for making too many maneuver errors, even if the errors do not have a direct bearing on safety.

In 1992 the Research and Development Section (R&D) within the California Department of Motor Vehicles (DMV) raised concerns related to the SDT referral process, scoring criteria, and guidelines for translating SDT performance into licensing actions. Subsequently, both R&D and the Driver Licensing Policy Unit initiated separate evaluations of the SDT program. This report presents the results of the first phase of R&D's study.

Methods
A total of 407 DL 11A forms used to refer drivers for SDT testing were collected from 82 DMV and Driver Safety units during October 18-29, 1993. Information on these forms was used to compute descriptive statistics of the SDT referral process, characteristics of SDT subjects, various groups' performances on the SDT, and the test's internal-consistency reliability. The ultimate criterion reliability of the SDT was evaluated by comparing the 3-year pre-SDT accident and citation rates for SDT passes and SDT fails.

The 1-year post-SDT driver records were also analyzed to determine what effect, if any, the SDT program had on safety risk. The actuarial risk differential of SDT referrals and a 1% random sample of drivers of the same age and sex in the general driving population was also computed.

Results

Characteristics of Referral Process and Subjects:

- The primary sources of SDT referrals are medical (39.8%), law enforcement (36.2%), and field offices (12.2%).

- The mean age of SDT subjects was 69.5, and 41.5% were women.

- The two most prevalent physical or mental conditions of SDT subjects were vision deficits (21.9%) and stroke (14.7%). Only 7.8% of subjects had no condition reported.

- 4.2% of SDT subjects had been hospitalized just before the referral, and 9.6% were on prescribed medication.

- The need to test for freeway driving ability was indicated for 17.2% of SDT subjects.

SDT Performance:

- 31.1% of subjects given the SDT failed it.

- The SDT items failed most often were visual search (16.7%), lane use (16.1%), concentration (11.7%), and reaction to hazards (11.7%). Fewer than 3% of subjects failed each of the following SDT items: distance, turnabout, equipment use, and backing.

SDT Reliability:

- The internal-consistency reliability of the SDT was .88.

Licensing Actions:

- 3/4 of all SDT referrals, as well as 3/4 of all SDT fails, had no license restriction or action recommended.

- Only 2.5% of SDT fails were recommended for license revocation.

- 96% of SDT fails were under license suspension or revocation sometime during the 6 months following SDT testing.

- Only 14% of SDT passes, 17% of SDT fails, and 14% of SDT referrals for whom an SDT result was not reported had a license restriction other than corrective lenses recorded on their driving record either before or after the SDT referral.

Driver Record Comparisons:

- SDT subjects had a 3-year prior accident rate of 34.1 per 100 drivers, which is 3 times higher than the standardized 3-year accident rate of 13.1 per 100 drivers for drivers of the same age and sex in the general driving population. In addition, the SDT subjects' 3-year prior citation rate of 49.3 per 100 drivers is nearly 2 times higher than the standardized 3-year citation rate of 25.8 per 100 drivers for drivers of the same age and sex in the general population.

- The 3-year prior accident rate for subjects who failed the SDT was not significantly different from that for subjects who passed the test. However, SDT fails had a significantly lower rate of 3-year prior total citations than did SDT passes.

- The accident and citation rates for subjects failing the SDT dropped substantially following SDT testing. However, no change was found in the accident and citation rates for those who passed the test.

Conclusions
- The internal-consistency reliability estimate is judged to be spuriously high and therefore is not considered a valid indicator of the SDT's true reliability.

- The low percentages of SDT referrals and SDT fails who were recommended for a licensing action, or had a license restriction other than corrective lenses imposed either before or within 1 year after the SDT referral, indicates that available treatments for incompetent drivers are underutilized.

- The SDT is not effective in discriminating between accident-free and accident-involved drivers.

- The fact that SDT referrals pose a much higher safety risk than do drivers of the same age and sex in the general population brings into question whether a special assessment system should even be available to the former group of drivers.

- The SDT program appears to reduce accident risk for drivers who fail the test but not for drivers who pass it.

Recommendations
- The department should consider eliminating special drive testing altogether, at least in its current form.

- If SDTs are to be given, the department should consider imposing license restrictions on all SDT referrals who are presumed, or have demonstrated, to be unable to pass the regular drive test. At a minimum, all such drivers should be restricted from driving at night.

- A unified policy directive should be developed that would address (1) the objective of the SDT, (2) the criteria used in referring applicants to an SDT, (3) the criteria to be used in scoring the SDT, and (4) the criteria for translating test performance into a licensing decision.

- If the department decides that a complete replacement of the SDT is needed, it should consider the results of field office studies of enhanced drive tests for older drivers currently being conducted by Dr. James McKnight of the National Public Services Research Institute (*Elderly Driver Referral Project* funded by the Center for Disease Control) and Dr. Mary Janke of the California Department of Motor Vehicles (*Evaluation of Drivers With Dementia or Age-Related Frailty* funded by the National Highway Traffic Safety Administration). Both studies utilize drive tests modelled after California's Driving Performance Evaluation road test, which is highly reliable and valid.

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INTRODUCTION

In California drivers are required to pass a drive test administered by the Department of Motor Vehicles (DMV) prior to licensure. The regular drive test (RDT) deducts points for minor maneuver errors, and a loss of more than 30 points counts as a failure. In addition, applicants can be automatically disqualified (DQed) for making a serious safety-related driving error. A maximum of three drive tests are allowed on each license application, and there is no restriction on the number of drive test failures that can be made on multiple applications. (Data for tracking prior drive test failures are not currently stored on the department's automated system.)

A special drive test (SDT) may also be administered in the licensing process. Candidates for an SDT include applicants who cannot pass the RDT or who have a known physical or mental (P/M) condition that may affect their driving ability. An SDT may also be required if documentation is received from law enforcement, a physician, family members, or some other source that brings into question the driving competence of the licensee. The SDT is scored either "satisfactory" (pass) or "unsatisfactory" (fail). An unsatisfactory test score is required if the driver makes a serious driving error that actually compromises the safety of themselves or other drivers or pedestrians. Minor maneuver errors are not scored on the SDT and therefore a point score is not given. The examiner is supposed to recommend license revocation if the SDT is failed and there is no indication that driving would improve with practice. A second SDT may be scheduled within 30 days if remedial practice is indicated. In addition, a follow-up SDT may be given in the area of the licensee's residence if they request it and the examiner thinks it is appropriate.

In 1992 DMV's Research and Development Section (R&D) raised several concerns related to the SDT referral process, scoring criteria, and guidelines for translating SDT performance into licensing actions (including license restriction). The Driver Licensing Policy Unit subsequently initiated a review of the SDT program, which is to include an assessment of the SDT scoring criteria. R&D is also in the process of evaluating the SDT. This report presents the findings of the first phase of R&D's evaluation, which consisted of an analysis of a 2-week sample of Driver Safety/Field Referral (DL 11A, see Appendix) forms and the driving records of individuals named on the forms. The primary objectives of this study were to (1) determine the percentage of SDT subjects referred from each referral source, (2) estimate the test's difficulty level, (3) identify what license action recommendations were made by the examiner for SDT fails, (4) determine whether the societal risk posed by SDT referrals is greater than that posed by the general population of licensed drivers of the same age and sex, (5) determine whether SDT performance is related to driving record, and (6) determine what effect, if any, the SDT program may have had on SDT subjects' safety risk. No attempt was made to evaluate the SDT's interrater or interroute (test-retest) reliabilities nor its validity as an indicator of driving competency.

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METHODS

Data Collection
All field offices and Driver Safety units conducting SDTs were requested to send to R&D copies of all DL 11A forms completed during October 18-29, 1993. The R&D clerical staff transcribed data from each DL 11A form onto a data collection form and then key entered the data into an electronic file. The pre- and post-SDT driving records of SDT referrals were extracted from the DL masterfile on December 19, 1994, approximately 1 year and 2 months after the DL 11A forms were collected.

Data Analysis
Information reported on the DL 11A forms pertaining to the SDT referral process or the characteristics of SDT subjects were summarized and tabulated. Descriptive statistics on SDT performance and any licensing recommendations made by the drive test examiners were also computed.

The internal-consistency reliability of the SDT was estimated using the Kuder-Richardson (K-R) internal-consistency formula. This type of reliability reflects the extent to which individual items on a performance test measure similar abilities or traits. The reliability coefficient theoretically can range from 0 to 1. A coefficient value of 0 indicates no similarity between items, and a value of 1 indicates the items are completely homogeneous. Internal-consistency reliability differs from interrater reliability, which measures the extent to which different examiners give similar scores when observing the same sample of driving behaviors. An important limitation to the interpretation of the K-R reliability coefficient for a test based on global subjective judgements (as the SDT is) is that the item scores are subject to halo artifacts, in which the rater's overall impression of the driver's competency directly influences scoring of the separate items. Where this occurs, the K-R coefficient will be spuriously high. Although interrater reliability is considered a better measure for assessing the psychometric adequacy of the SDT, the limited scope of this study precluded its use because it would have involved having two examiners score each SDT. Internal-consistency reliability also is usually different than test-retest and equivalent-forms reliabilities if the test is factorially complex or heterogeneous in content.

The accident and citation rates for SDT subjects during the 3 years preceding SDT testing were compared to those for a 1% random sample of the general California driving population during 1989-91. This analysis was conducted to determine whether drivers referred for an SDT pose a significantly higher or lower actuarial risk than do drivers of the same age and sex in the general population. This question is relevant because one reason that has been offered for giving an SDT instead of an RDT is that drivers referred for an SDT have adequately compensated for any reduced level of driving ability caused by their P/M conditions or other driving-related factors.

The pre-SDT accident and citation rates for subjects who failed the SDT were compared to those for subjects who passed the SDT. The purpose of this analysis was to determine the test's ultimate criterion validity—i. e., whether SDT performance per se is a good indicator of accident risk. It was not possible to evaluate the SDT's construct validity—its ability to distinguish between good and bad drivers—because an

independent measure of driving competency that could be correlated with SDT performance was unavailable. The 1-year post-SDT accident and citation rates for SDT passes and fails were also analyzed to determine what effect, if any, the SDT program and follow-up licensing actions may have had on the safety risk of these drivers.

SPSS statistical software was used for all data analyses. The analysis of variance (ANOVA) statistical procedure was used to test the statistical significance of group differences on accident and citation rates.

<div align="center">RESULTS</div>

Characteristics of SDT Referrals

A total of 407 usable DL 11A forms were received from 82 field offices and Driver Safety units. A referral source was not specified on 161 (39.6%) of the forms. This large underreporting of referral source was mostly due to the fact that 1/4 of the forms received were an older version of the DL 11A, which did not have boxes for recording this information. However, source of referral was sometimes recorded elsewhere on the older form, and in these cases the information was used in the analysis. Table 1 presents the number and percentage of drivers referred from each source for the 246 cases for which source of referral was reported. Medical and law enforcement referrals accounted for 187 (76.0%) of the total reported cases.

<div align="center">Table 1</div>

<div align="center">Number (n) and Percentage of Total Referrals by Referral Source
for Subjects Having Source of Referral Reported</div>

Source of referral	n	% of total ($N = 246$)
law enforcement	89	36.2
medical	98	39.8
field office	30	12.2
other	29	11.8

Table 2 presents the number of referral subjects, the percentage of total subjects, and the percentage of women subjects by age group. Five cases were excluded due to missing data on age or sex. The majority of referral subjects were 70 or older, and nearly 1/5 were at least 85. However, relatively young drivers were also represented, with 1/5 of the subjects being under 55 years old. The mean age was 69.5, and 41.5% of the total sample were women.

<div align="center">3</div>

Table 2

Number (*n*) and Percentage of SDT Referrals,
and Percentage of Women, by Age Group

Age group	*n*	% of total ($N = 402$)	% women
39 or younger	43	10.7	44.2
40-54	41	10.2	48.8
55-69	65	16.2	27.7
70-84	177	44.0	46.9
85 or older	76	18.9	35.5
total	402	100.0	41.5

Note. Five of the 407 subjects in the sample are not represented due to missing data on their age and sex.

The need for a specific type of test was not indicated on 155 (38.1%) of the DL 11A forms. This underreporting of what tests were needed can be largely explained by the fact that this item of information was not collected on the older version of the DL 11A form (which, again, was received for 1/4 of the total sample). Table 3 shows the number and percentage of referrals by type of test needed for the 252 cases for which this information was reported. A drive test was needed by 231 (91.7%) of these subjects.

Table 3

Number (*n*) and Percentage of Total SDT Referrals by Type of Test Needed

Test needed	*n*	% of total ($N = 252$)
vision	100	39.7
law	40	15.9
drive	231	91.7

Note. Table entries represent subjects for whom the DL 11A form indicated a test was needed. The need for more than one test was specified for some subjects, therefore entries in the table are not independent and the sum of percentages exceeds 100.0.

The DL 11A forms were also scrutinized for any evidence that the subject had a P/M condition. Table 4 shows the number and percentage of subjects having each type of P/M condition identified on the form. Thirty-nine (9.6%) of the subjects had 2 or more P/M conditions and 8 (2.0%) had 3 or more. Only 32 (7.8%) had no evidence of a P/M condition recorded on the form.

Information recorded on the forms also indicated that 17 (4.2%) of the subjects had been hospitalized and 39 (9.6%) were on medication.

Table 4

Number (*n*) and Percentage of Total SDT Referrals by Type of P/M Condition

P/M condition	*n*	% of total (*N* = 407)
vision	89	21.9
stroke	60	14.7
traffic accidents	35	8.6
annual reexamination	34	8.4
other (unspecified)	29	7.1
dementia (diagnosed/possible)	28	6.9
diabetes	24	5.9
brain injury	20	4.9
CP	18	4.4
confusion	14	3.4
lapses of consciousness/seizures	11	2.7
lack of skill	11	2.7
cardiovascular	10	2.5
Parkinson's disease	6	1.5
arthritis/bone or joint degeneration	6	1.5
psychiatric	6	1.5
multiple sclerosis	5	1.2
Alzheimer's disease	4	1.0
hearing	4	1.0
pulmonary disease	3	0.7
cancer	3	0.7
pain	2	0.5

Note. The sum of percentages exceeds 100.0 because some subjects had more than one P/M condition identified.

Table 5 presents the number and percentage of subjects who were identified on the DL 11A as needing special consideration in testing for their ability to drive at night, on the freeway, in a restricted area, or in some other circumstance. It is unknown whether the SDT was actually conducted under these driving conditions. Freeway driving was by far the most frequent driving condition recommended for consideration. Very few subjects were indicated to be in need of nighttime driving consideration (which may be more reflective of DMV's reluctance to administer drive tests at night than to a general lack of concern over the subjects' night driving abilities).

Table 5

Number (*n*) and Percentage of Total SDT Referrals by Type of Consideration Needed

Consideration	*n*	% of total (*N* = 407)
freeway	70	17.2
nighttime	6	1.5
area drive	26	6.4
other	25	6.1

SDT Performance

Test results. A total of 299 subjects (73.5% of all referrals) had a satisfactory or unsatisfactory drive test result recorded on the form. SDT performance measures were computed for these subjects only. Thus, an unknown number of subjects who were given the SDT, but for whom test results were not available or reported, were excluded from the analysis. Of the 108 cases in which drive test result was unavailable, 76 were due to a copy of the back side of the DL 11A (where SDT scores were to be recorded) not being submitted and 32 were due to the subject's not appearing for their scheduled SDT appointment, vehicle mechanical failure, lack of auto insurance, or some other reason. The exclusion of these subjects was not considered a significant source of bias in estimating test difficulty because a supplemental analysis determined that they did not differ significantly (*p*>.10) from data-available subjects on 3-year prior accident and citation rates, average age, or percentage of women.

Table 6 presents SDT fail (unsatisfactory) rate by referral source for the 299 subjects who had a drive test result recorded, including those for whom the source of referral could not be identified. The overall fail rate was 31.1%. The fail rates for law enforcement, medical, and field office referrals were fairly similar, with rates of 30.0%, 29.6%, and 37.3%, respectively. Subjects with "other" marked as the referral source performed the worst, with a fail rate of 56.0%. This group would be expected to include drivers referred by family members and other concerned citizens, from accident reports, and from other miscellaneous sources. (The high volume of cases in which source of referral was not stated was, again, largely due to 1/4 of the forms collected being an older version of the DL 11A, which did not require referral source to be recorded.)

Table 6

Number of Subjects (*n*) and SDT Fail Rate by Referral Source

Source of referral	*n*	% failing
law enforcement	70	30.0
medical	71	29.6
field office	22	27.3
other	25	56.0
not stated	111	27.9
total	299	31.1

Note. Results are for subjects having a satisfactory or unsatisfactory drive test result recorded on the DL 11A form.

Table 7 presents the number and percentage of subjects failing the SDT for each P/M condition category with 15 or more subjects having a drive test result recorded on the form. (The P/M conditions are listed in the same order as in Table 4.) The fail rate was lowest for subjects who had a stroke (13.8%) and highest for subjects with diagnosed or possible dementia (40.0%). The fail rate for subjects with no P/M condition specified on the DL 11A was 37.0% (*n* = 27). For subjects with two or more P/M conditions, the fail rate was 32.1% (*n* = 28).

Table 7

Number of Subjects (*n*) and SDT Fail Rate by Type of P/M Condition

P/M condition	*n*	% failing
vision	47	31.9
stroke	29	13.8
traffic accidents	31	29.0
annual reexamination	28	39.3
dementia (diagnosed/possible)	25	40.0

Note. Results are for the 299 subjects for whom a satisfactory or unsatisfactory drive test result was indicated on the DL 11A. The table includes only P/M condition categories having drive test results available for 15 or more subjects.

Subjects on medication had a fail rate of 33.3% (*n* = 21). A fail rate was not computed for subjects who had been hospitalized because only three of them had a drive test result recorded on the form.

Item results. Table 8 shows the number and percentage of subjects receiving an unsatisfactory item score for each test item. All items were included on both the old and new versions of the DL 11A, with the exception of equipment use, which appeared only on the new version. As before, these results are based only on the 299 subjects for whom a drive test result was reported.

The four items failed most often were visual search (16.7%), lane use (16.1%), concentration (11.7%), and reaction to hazards (11.7%). The four items failed least often (each by fewer than 3% of subjects) were following distance, turnabout, equipment use, and backing.

As stated above, SDT policy requires the SDT to be scored as unsatisfactory if any individual item is marked unsatisfactory. The extent to which this was followed was assessed by comparing test scores with item results. In four cases the SDT was satisfactory and one or more items were unsatisfactory, and in seven other cases the SDT was unsatisfactory even though all of the items were satisfactory. This inconsistency between test scores and item scores is small and could be due to errors in transcribing or key entering data from the DL 11A forms.

Table 8

Number (n) and Percentage of Subjects Receiving an
Unsatisfactory Item Score by Test Item

Test item	n	% unsatisfactory ($N = 299$)
controlled intersection	27	9.0
uncontrolled intersection	16	5.4
traffic signs/signals	31	10.4
right turns	22	7.4
left turns	29	9.7
right lane changes	26	8.7
left lane changes	34	11.4
lane use	48	16.1
following distance	3	1.0
backing	7	2.3
turnabout	4	1.3
vehicle control	27	7.0
equipment use	6	2.0
speed	28	9.4
concentration	35	11.7
reaction to hazards	29	9.7
reaction to traffic	35	11.7
reaction to pedestrians	10	3.3
visual search	50	16.7

Note. Results are for subjects having a satisfactory or unsatisfactory drive test result recorded on the DL 11A. More than one item may have been marked unsatisfactory for individual subjects.

Test Reliability

The internal-consistency reliability of the SDT was .88, which indicates a fairly high level of homogeneity among test items.

Licensing Recommendations

Data recorded on the DL 11A were analyzed to identify what licensing restriction or action if any was recommended by the examiner. Table 9 presents the number and percentage of subjects receiving each type of recommendation. Nearly 3/4 of all SDT referrals had no license restriction or action recommended. Eye lenses restriction was the most common recommendation (8.4%), and license revocation was the least common (2.5%). The small number of revocation recommendations is surprising considering that SDT policy requires the examiner to recommend revocation when the test is unsatisfactory and there is no indication that the licensee's driving would improve with practice. One possible explanation for this finding is that some examiners, knowing that SDT policy requires license revocation for SDT fails, may have thought it unnecessary to explicitly recommend revocation on the form.

Table 10 cross-classifies subjects by drive test result and recommended license action.

Table 9

Number (n) and Percentage of Subjects by
Type of License Restriction or Action Recommended

Restriction or action	n	% of total ($N = 407$)
revocation	10	2.5
no freeway	22	5.4
daytime only	17	4.2
area	21	5.2
lenses	34	8.4
steering wheel knob	13	3.2
reexamination	16	3.9
other	39	9.6
none stated	295	72.7

Note. Results are based on all SDT referrals. Percentages do not sum to 100.0% because individual subjects may have had more than one license restriction or action recommended by the examiner.

Table 10

Number of Subjects (*n*) by SDT Result and Type of License
Restriction or Action Recommended

Restriction or action	SDT satisfactory	SDT unsatisfactory
revocation	0	10
no freeway	17	5
daytime only	14	2
area	17	3
lenses	29	4
steering wheel knob	11	1
reexamination	15	1
other	35	2
none stated	128	71

As would be expected, licensing restrictions were sometimes recommended even though the drive test result was satisfactory. However, there were several instances in which license restriction rather than revocation was recommended following an unsatisfactory drive test, which appears to conflict with SDT program guidelines. Also troubling is the fact that no licensing action was recommended for 71 of the 99 subjects who failed the SDT.

Driver Record Analysis
Table 11 presents 3-year total accident and citation rates for SDT referral subjects and a randomly selected 1% sample of California licensed drivers by age group and sex. Table entries for SDT subjects are for the 3 years immediately preceding SDT test date. Entries for licensed drivers in general are for 1989-1991. Citations include convictions, failures to appear in court or pay fines, and traffic violator school citation-dismissals. Five cases were excluded from the analysis because their driving records were not available when the extract from the DL masterfile was made.

In every age and sex category, SDT subjects have much higher accident and citation rates than do licensed drivers.

The overall accident and citation rates for SDT subjects are not directly comparable to those for drivers in general because the proportional representation of subjects in each category of age and sex are not the same for the two groups. To make a comparison possible, the accident and citation rates for the general driver population were standardized to reflect the same proportion of subjects in each age and sex category as obtained for the SDT subjects. Table 12 presents the actual rates for SDT subjects and the standardized rates for drivers in general. The accident rate for SDT referral subjects is 3 times higher than the standardized rate for drivers of similar age and sex in the general driving population. The citation rate for the SDT group is nearly 2 times higher than the standardized rate for drivers in general. These group differences are both statistically significant ($p < .001$).

Table 11

Number of Drivers (*n*) and 3-Year Accident and Citation Rates by Age
Group and Sex for SDT Referrals and the California Licensed Driver Population

Accidents

Age group Sex	SDT		CA licensed drivers	
	n	Accidents/ 100 drivers	*n*	Accidents/ 100 drivers
39 or younger				
men	24	66.7	55,963	21.6
women	19	21.1	47,329	16.2
40-54				
men	21	52.4	23,100	16.3
women	20	30.0	20,917	10.7
55-69				
men	47	27.7	13,650	14.1
women	18	22.2	12,797	8.3
70-84				
men	94	28.7	4,837	13.6
women	83	37.4	4,821	9.3
85 or older				
men	49	34.7	219	16.0
women	27	29.6	178	7.9

Citations

Age group Sex	SDT		CA licensed drivers	
	n	Citations/ 100 drivers	*n*	Citations/ 100 drivers
39 or younger				
men	24	179.1	55,963	112.5
women	19	84.2	47,329	55.8
40-54				
men	21	109.5	23,100	56.8
women	20	60.0	20,917	30.1
55-69				
men	47	44.7	13,650	32.7
women	18	33.3	12,797	13.6
70-84				
men	94	40.4	4,837	17.3
women	83	22.9	4,821	8.0
85 or older				
men	49	24.5	219	13.7
women	27	29.6	178	3.4

Table 12

3-Year Accident and Citation Rates for SDT Referrals and the
California Licensed Driver Population

Group	Total accidents (per 100 drivers)	Total citations (per 100 drivers)
SDT referrals	34.1	49.3
CA licensed drivers	13.1	25.8

Note. Entries for California licensed drivers represent a 1% random sample of the general driving population. The rates for this group are standardized to reflect the same proportion of subjects in each age and sex category as obtained for SDT referral subjects. Two-tailed statistical significance tests found that the groups differed significantly on accident rate ($t = 3.77$, $p < .001$) and citation rate ($t = 5.44$, $p < .001$).

The much higher accident rate for SDT subjects can be attributed in part to the fact that in 35 cases the DL 11A form indicated that the SDT referral was precipitated wholly or partially by an accident. Because this trigger was not frequent, it was not considered a serious source of bias. To obtain an idea of the magnitude of the bias, the 35 cases were removed and the accident mean was recalculated. This reduced the accident rate from 34.1 to 30.8 per 100 drivers. Even the lower rate is over twice as large as the standardized rate for the general driver group.

Table 13 presents 3-year prior accident and citation rates for SDT subjects by SDT result. The difference in accident rates is not statistically significant ($p = .78$). In addition, subjects who failed the SDT had a significantly lower rate of prior total citations ($p < .05$) than did those who passed the test. These results fail to establish the validity of using SDT performance as an indicator of level of safety risk.

Table 13

Number of Subjects (n) and 3-year Prior
Accident and Citation Rates by SDT Result

SDT result	n	Total accidents per 100 drivers	Total citations per 100 drivers
satisfactory	202	35.6	59.9
unsatisfactory	93	33.3	32.3

Note. Analysis of variance two-tailed tests found that the two groups did not differ significantly on total accident rate ($F = .08$, $p = .78$), but did differ significantly on total citation rate ($F = 4.28$, $p < .05$).

Table 14 presents the accident and citation rates for SDT passes and SDT fails for the first year subsequent to testing. For those passing the test, the 1-year rates and prior 3-year rates are proportionately equal, indicating that the SDT program had no effect on safety risk for this group. For those failing the test, on the other hand, the 1-year rates are proportionately much lower than the prior 3-year rates, suggesting that the SDT program reduces safety risk for drivers identified by the SDT as being incompetent.

This finding suggests that the SDT program reduces accident risk for some drivers. However, this effect must be judged against the even larger safety benefit that could have been achieved if drivers who failed the RDT had their licenses revoked instead of being referred for the SDT.

Table 14

Number of Subjects (*n*) and 1-year Subsequent
Accident and Citation Rates by SDT Result

SDT result	*n*	Total accidents per 100 drivers	Total citations per 100 drivers
satisfactory	202	10.40	12.38
unsatisfactory	93	1.08	2.15

The driver record analysis also revealed that 96% of subjects who failed the SDT were under a license suspension or revocation sometime during the 6 months following SDT testing, while only 26% of subjects who passed the test had suspended or revoked licenses during this period. (The percentage of suspended or revoked drivers during the 6 months prior to testing was 43% and 33% for drivers who failed and passed the SDT, respectively.) This finding suggests that a licensing action was almost always ultimately taken against drivers who failed the SDT, even though the examiner may not have recommended revocation. However, the suspension or revocation action may have been taken for reasons other than failing the SDT (e.g., the accumulation of neg-op points following testing). In any event, the fact that the vast majority of SDT fails had their licenses revoked following testing would explain the large reduction in this group's safety risk following testing.

A review of driver record printouts revealed that only a small percentage of subjects—14% of SDT passes, 17% of SDT fails, and 14% of SDT referrals for whom an SDT result was not reported—had a license restriction other than corrective lenses imposed either before or within 1 year after their referral for an SDT. This finding suggests that license restrictions are underused for treating high-risk drivers who are presumed, or have demonstrated, to be unable to pass the regular drive test.

CONCLUSIONS AND RECOMMENDATIONS

The descriptive measures of the SDT referral process and of SDT subjects do not indicate any problem areas, except a possible underreporting of SDT referral source on the DL 11A. The reporting of referral source could probably be increased by reminding users of the form to record this information.

The SDT performance results do not provide evidence of the test's construct validity. The 37.0% fail rate for subjects with no specified P/M condition was nearly as high as the 40.0% fail rate for subjects with Alzheimer's disease, and was higher than the 32.1%

fail rate for subjects with two or more P/M conditions. These findings, which are contrary to what would be expected if the SDT were a valid indicator of driving ability, should not be considered definitive because the study was not specifically designed to evaluate the test's construct validity. However, the fact that the SDT lacks several psychometric properties of good tests (e. g., behaviorally-referenced and standardized scoring criteria) makes it highly improbable that the test would have significant construct validity.

The internal-consistency reliability of the SDT is very high for a road test, particularly one in which scoring is very subjective and general as is the case with the SDT. Although such factors normally cause a test to be less reliable, one can get a spuriously high degree of reliability from a "halo effect," in which the examiner's general overall view of the driver influences their ratings of the separate test items. The tendency of examiners to score as many items unsatisfactory as possible to better justify SDT failure (as they were trained to do) could also have inflated the reliability coefficient. For these reasons, the internal-consistency reliability estimate obtained in this study should not be considered to be a valid indicator of the true reliability of the SDT.

The finding that 3/4 of SDT referrals were not recommended for a license restriction or revocation, and that only a small percentage of subjects had a license restriction other than corrective lenses on record, indicates a major weakness in driver licensing policy. Why are the vast majority of drivers whose level of driving competency is presumably or demonstrably too deficient to pass the RDT not recommended for any restriction or remediation at all? A strong argument could be made that drivers referred for special testing should at least be restricted from nighttime driving, since any limitation in their driving abilities would be accentuated when driving at night. In addition, the finding that 3/4 of SDT fails were not recommended for any license action, and that only about 1/10 of SDT fails were recommended for license revocation, indicates a possible underutilization of available treatments for incompetent drivers.

Although very few SDT fails were recommended for license revocation, 96% of all subjects who failed the test nevertheless were under license suspension or revocation during the 6 months following SDT testing (compared to only a 26% rate for SDT passes). It is unknown in how many of these cases the licensing action was taken because the driver had accidents or citations after SDT testing or had failed additional driving tests. Any such delay in license revocation could be considered a needless public safety risk because current DMV policy permits the license privilege to be revoked based on SDT failure alone. R&D is in the process of more thoroughly analyzing the post-SDT driving records of SDT subjects to determine exactly what actions were taken, and when, following SDT failure. The results will be submitted in a follow-up report.

The comparison of driver records of SDT subjects and licensed drivers in general found evidence that SDT referrals are at a far higher than standard risk of accidents and citations. This result provides justification for taking some form of licensing action against those selected for an SDT, as recommended above. It also contradicts the notion that SDT referrals sufficiently moderate their accident risk by self-restricting the amount and conditions of their driving, and therefore brings into question whether a special assessment system should even be available to these drivers.

The reduction in accident risk for subjects who failed the SDT is not considered supportive of the SDT program. The reason is that most, if not all, of these subjects would have also failed the RDT, and therefore this risk reduction could have been achieved just as easily under the RDT program. In fact, an even greater safety benefit would be expected if the SDT program were eliminated, because RDT fails would then not be able to circumvent license revocation by subsequently passing an easier test.

The results of this study also bring into question the ultimate validity of the SDT. SDT passes and fails did not differ significantly on accident rate, and the citation rate for SDT fails was significantly lower than that for SDT passes. This finding per se does not necessarily mean that the SDT is a bad test, however, because driver-record measures largely reflect differences in amount of risk exposure and therefore are not good indicators of level of driving competency (which is what the SDT was designed to assess). It was not possible to statistically adjust the accident and citation measures to control for the effects of exposure variables (e.g., annual mileage) because data on the latter were unavailable. However, there is no logical reason to hypothesize that drivers taking an SDT would drive more than other licensed drivers of the same age and sex.

The results of this study indicate a need for a thorough review of existing SDT policy. In addition, existing documentation on SDT policy do not provide specific and unambiguous guidelines for the referral, testing, and treatment of SDT subjects. Therefore, if the department continues to give SDTs, it is recommended that a unified policy directive be developed that would address (1) the objective of the SDT, (2) the criteria used in referring applicants to an SDT, (3) the criteria to be used in scoring the SDT, and (4) the criteria for translating test performance into a licensing decision.

If the department decides that a replacement to the SDT is needed, it should consider the results of field office studies of enhanced drive tests for older drivers currently being conducted by Dr. James McKnight of the National Public Services Research Institute (*Elderly Driver Referral Project* funded by the Center for Disease Control) and Dr. Mary Janke of the California Department of Motor Vehicles (*Evaluation of Drivers With Dementia or Age-Related Frailty* funded by the National Highway Traffic Safety Administration). Both studies utilize drive tests modelled after California's Driving Performance Evaluation road test, which is highly reliable and valid.

APPENDIX

DMV
STATE OF CALIFORNIA
DEPARTMENT OF MOTOR VEHICLES
A Public Service Agency

DRIVER SAFETY/FIELD REFERRAL

11A

☐ Driver Safety to Field Office ☐ Field Office to Driver Safety

FULL NAME (FIRST, MIDDLE, LAST) _____ DRIVER LICENSE NUMBER _____

ADDRESS _____ DATE OF BIRTH _____

CITY _Oakland_ _CA_ STATE _____ ZIP _94601_ DAYTIME PHONE NUMBER _____

TESTS GIVEN BEFORE REFERRAL

☐ Vision B _____ R _____ L _____ ☐ Law P _____ F _____ TESTS NEEDED ☐ Vision ☐ Law ☐ Drive

TO BE COMPLETED BY DRIVER SAFETY

Source of Referral ☐ Law Enforcement ☑ Medical ☐ Field Office ☐ Other _____

BRIEF DESCRIPTION OF CONDITION

Loss of R leg above the Knee

SPECIAL CONCERNS _Weakness mobility or range motion, coordination_

SPECIAL EQUIPMENT _Overall ability to compensate_

SPECIAL DRIVE TEST CONSIDERATIONS

☐ Freeway ☐ Nightime ☐ Area Drive ☐ Other

DRIVER SAFETY OFFICE _Oakland_ PHONE NUMBER _450 - 3700_ HEARING OFFICER'S NAME (PRINT) _B. COLEMAN_

SIGNATURE OF HEARING OFFICER

X _B. Coleman_ DATE _September 2, 1993_

TO BE COMPLETED BY FIELD OFFICE

ILLNESS OR CONDITION _____

HOSPITALIZED _____

MEDICATION _____

DOCTOR – NAME AND ADDRESS _____

FIELD OFFICE _____ PHONE NUMBER _____ EXAMINER'S NAME (PRINT) _____

SIGNATURE OF EXAMINER

X _____ D NUMBER _____ DATE _____

DL 1 FA (REV. 7/91)

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FULL NAME (FIRST, MIDDLE, LAST)	DRIVER LICENSE NUMBER

SPECIAL DRIVE TEST

☒ Did not appear for drive test   Examiner's Initials: _FMC_

SAT	UNSAT		SAT	UNSAT		SAT	UNSAT	
		Controlled Intersection			Lane Use			Concentration
		Uncontrolled Intersection			Following Distance			Reaction to Hazards
		Traffic Signs/Signals			Backing			Reaction to Traffic
		Right Turns			Turnabout			Reaction to Pedestrians
		Left Turns			Vehicle Control			Visual Search
		Right Lane Changes			Std. Veh. Equip. Use			
		Left Lane Changes			Speed			

SUMMARY OF DRIVE TEST

RESTRICTION(S) RECOMMENDED

SPECIAL EQUIPMENT USED

WOULD PROFESSIONAL INSTRUCTION HELP?
☐ Yes   ☐ No

TIME TEST BEGAN	TIME TEST ENDED	TOTAL TIME

RESULT OF DRIVE TEST
☐ Satisfactory   ☐ Unsatisfactory

FIELD OFFICE	PHONE NUMBER	EXAMINER'S NAME (PRINT)

SIGNATURE OF EXAMINER	ID NUMBER	DATE
x		

DL 12A (REV. 7/91)